

## ABSTRACT OF THE DISCLOSURE

Free-space optical transceivers employ wavelength conversion from a fiber interface wavelength  $\lambda_{\text{fiber}}$  to a free-space transform wavelength  $\lambda_{\text{fs}}$  and back again to overcome a broad range of environmental impacts to the free-space optical signal, such as fog. The wavelength conversions may be performed all-optically without the need for electro-optical conversion, or the wavelength conversions may be performed using electro-optical conversion. The performance of the chosen value for the free-space transform wavelength  $\lambda_{\text{fs}}$  may be monitored and a feedback control system used to dynamically adjust the value for  $\lambda_{\text{fs}}$  until the optimum value for the given atmospheric conditions is achieved. Cooperating transceivers can be informed of a newly selected value for  $\lambda_{\text{fs}}$  via a direct, out-of-band control communications channel, or cooperating transceivers can determine the appropriate wavelength transform amount to be applied by an adaptive wavelength selection determination.